New Combinations for Chinese Bamboos (Poaceae, Bambuseae)

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ABSTRACT. On the basis of morphological characters inconsistent with their current taxonomic placements, new combinations are made for the following species of woody bamboos within the flora of China: *Ampelocalamus breviligulatus*, *Ampelocalamus hirsutissimus*, *Ampelocalamus melicoides*, *Drepanostachyum semiorbiculatum*, *Drepanostachyum ampullarium*, *Drepanostachyum membranaceum*, and *Bonia parvifloscula*. To accommodate broader generic concepts, new combinations are made for *Arundinaria qingchengshanensis* and *Arundinaria spanostachya*, and new status is given to *Bashania* as *Arundinaria* subgen. *Bashania*, and to *Sarocalamus* as *Arundinaria* subgen. *Sarocalamus*.

Key words: *Ampelocalamus*, *Arundinaria*, Bambuseae, *Bashania*, *Bonia*, China, *Drepanostachyum*, Poaceae, *Sarocalamus*.

During the preparation of a collaborative account of Chinese bamboos for the English-language *Flora of China*, it became apparent that there was a need for several new combinations for species names in *Ampelocalamus* S. L. Chen, T. H. Wen & G. Y. Sheng, *Drepanostachyum* Keng f., *Arundinaria* Michaux, and *Bonia* Balansa, and for the provision of names at subgeneric rank within *Arundinaria* s.l. for *Bashania* Keng f. & T. P. Yi and *Sarocalamus* Stapleton.

AMPELOCALAMUS

Ampelocalamus breviligulatus (T. P. Yi) Stapleton & D. Z. Li, comb. nov. Basionym: *Drepanostachyum breviligulatum* T. P. Yi, J. Bamboo Res. 12(4): 42. 1993. TYPE: China. Sichuan: Jiange Xian, 18 Dec. 1983, *Yi Tong-Pei 83208* (holotype, SIFS not seen).

Ampelocalamus hirsutissimus (W. D. Li & Y. C. Zhong) Stapleton & D. Z. Li, comb. nov. Basionym: *Drepanostachyum hirsutissimum* W. D. Li & Y. C. Zhong, in J. Bamboo Res. 16(1): 52. 1997. TYPE: China. Guizhou: Guiyang, Bamboo Garden of GF, 5 Mar. 1992, *Zhong Yuan-Chun et al. 9203* (holotype, GF not seen).

Ampelocalamus melicoides (Keng f.) D. Z. Li & Stapleton, comb. nov. Basionym: *Drepanostachyum melicoideum* Keng f., J. Bamboo Res. 5(2): 35. 1986. TYPE: China. Sichuan: Nanchuan Xian, 4 May 1957, *G. F. Li 60336* (holotype, NJNU; isotype, SZ).

Ampelocalamus and *Drepanostachyum* are subtropical clump-forming bamboo genera with type species from Hainan Island and the Himalayas of northwest India, respectively. They differ in several characters. The culm nodes and branching in *Ampelocalamus* are adapted for a semi-scandent growth habit, with expanded nodal sheath scars, geniculate lateral branches, a large central branch that often remains dormant, and a capacity for aerial root growth on the swollen bases of larger branches. Culms of *Drepanostachyum* are self-supporting and lack these adaptations. The inflorescence in *Ampelocalamus* also differs in having larger, broader spikelets (to 35 × 5 mm vs. 20 × 3 mm). *Ampelocalamus* is distributed from Taiwan and Hainan Island to the wettest parts of the Himalayas, especially on calcareous soils, while *Drepanostachyum* is found along the Himalayas in drier subtropical forest types associated with trees in *Quercus* L., *Schima* Reinwardt ex Blume, and *Castanopsis* (D. Don) Spach.

The two genera were confused by transferral of

most species of *Ampelocalamus* into *Drepanostachyum* (Keng, 1986; Yi, 1993) and eventually by the synonymizing of *Ampelocalamus* within *Drepanostachyum* (Li, 1997). However, recent molecular data (Ní Chonghaile, 2002) has suggested that they are not so closely related, with *Drepanostachyum* in a clade (Bootstrap Support 73%) that did not include *Ampelocalamus*.

The generic characteristics of *Ampelocalamus breviligulatus* have not been investigated in depth, but the large discrepancy in branch sizes with a dominant central branch and finer lateral branches, along with the deeply ridged culm internodes suggest that it is more likely to belong in *Ampelocalamus* than in *Drepanostachyum*. This is reinforced by its distribution in Sichuan and Gansu provinces of China, rather than the Himalayas.

Described as related to *Ampelocalamus scandens* Hsueh & W. D. Li, with apically arching culms and patelliform nodes, and illustrated as having a branch complement with strongly geniculate lateral branches, *Ampelocalamus hirsutissimus* would also appear more appropriately placed in *Ampelocalamus* rather than in *Drepanostachyum*. The ciliolate culm sheath margins and prominent leaf sheath oral setae are similar to those of *A. patellaris* and *A. scandens*, respectively.

The dominant central branch and geniculate lateral branches, along with broad spikelets suggest that *Ampelocalamus* is also more appropriate than *Drepanostachyum* for *A. melicoides*.

DREPANOSTACHYUM

Drepanostachyum semiorbiculatum (T. P. Yi) Stapleton, comb. nov. Basionym: *Fargesia semiorbiculata* T. P. Yi, J. Bamboo Res. 2(2): 40. 1983. TYPE: China. Tibet: Cona Xian, 7 Jan. 1978, *Jiang Changgui 1* (holotype, SIFS not seen).

Drepanostachyum ampullarium (T. P. Yi) Stapleton, comb. nov. Basionym: *Fargesia ampullaris* T. P. Yi, J. Bamboo Res. 2(2): 18. 1983. TYPE: China. Tibet: Zhangmu, 4 Nov. 1979, *M. L. Zhou 4* (holotype, SIFS not seen).

Drepanostachyum membranaceum (T. P. Yi) D. Z. Li, comb. nov. Basionym: *Fargesia membranacea* T. P. Yi, Acta Bot. Yunnan. 14(2): 135. 1992. TYPE: China. Sichuan: Mianning Xian, *Yi Tong Pei 90172* (holotype, SIFS not seen).

The type species of *Drepanostachyum*, *D. falcatum* (Nees) Keng f., was not known at all in China, while several well-known species of *Ampelocalamus* had been transferred into *Drepanostachyum*. Therefore *Drepanostachyum* was misunderstood in China, where it was considered very similar to *Ampelocalamus*, which was still recognized (Keng & Wang, 1996), albeit for only 2 less well-known species. Meanwhile, when species of *Drepanostachyum* were encountered in the Himalayas of southeast Tibet, they were placed in an altogether different genus, *Fargesia* Franchet. Section *Sphaerigemma* T. P. Yi and series *Ampullares* T. P. Yi were described largely to accommodate these mainly Himalayan species within *Fargesia*, because of their semi-orbicular culm buds and swollen culm nodes, not seen in other species of the genus.

Fargesia semiorbiculata and *F. ampullaris* also differed substantially from other species placed in *Fargesia* in their larger number of more subequal branches, leaf blades with indistinct transverse veins, the narrow apex and distally scabrous interior surface of their culm sheaths, and their subtropical rather than temperate habitats. These characteristics are shared with the type species of *Drepanostachyum*, *D. falcatum*, into which genus they are now transferred.

Fargesia membranacea differs from most other species in *Fargesia* in its semi-orbicular branch buds producing 13 to 33 subequal branches, its leaf blades with indistinct transverse veins, and the narrow apex to its culm sheaths, characteristics more suggestive of *Drepanostachyum* than *Fargesia*. Known only from southern Sichuan province, this species is well separated from all other species of *Drepanostachyum*.

ARUNDINARIA

Arundinaria subgen. **Sarocalamus** (Stapleton) D. Z. Li, stat. nov. Basionym: *Sarocalamus* Stapleton, Novon 14: 346. 2004. TYPE: *Sarocalamus racemosus* (Munro) Stapleton.

Arundinaria subgen. **Bashania** (Keng f. & T. P. Yi) D. Z. Li, stat. nov. Basionym: *Bashania* Keng f. & T. P. Yi, J. Nanjing Univ., Nat. Sci. Ed. 1982(3): 722. 1982. TYPE: *Bashania fargesii* (E. G. Camus) Keng f. & T. P. Yi.

Arundinaria qingchengshanensis (Keng f. & T. P. Yi) D. Z. Li, comb. nov. Basionym: *Bashania qingchengshanensis* Keng f. & T. P. Yi, J. Nanjing Univ., Nat. Sci. Ed. 1982(3): 725. 1982. TYPE: China. Sichuan: Guan Xian, 25 June 1981, *Yi Tong-Pei 80037* (holotype, SIFS).

Arundinaria spanostachya (T. P. Yi) D. Z. Li, comb. nov. Basionym: *Bashania spanostachya* T. P. Yi, Acta Bot. Yunnan. 11: 35. 1989. TYPE: China. Sichuan: Huili Xian, Beimu Shan, 18 May 1987, *Yi Tong-Pei 87249* (holotype, SIFS).

Although it is strongly suspected that *Bashania* Keng f. & T. P. Yi and *Sarocalamus* Stapleton are probably not closely related to the North American genus *Arundinaria* (Ní Chonghaile, 2002; Stapleton et al., 2004), the morphological distinctions are less pronounced than those between *Arundinaria* and all other Chinese genera. As the *Flora of China* follows a primarily morphological classification system, these three genera will be merged into a rather broadly interpreted *Arundinaria*. Hopefully further molecular data will provide clarification of the true relationships between these groups. New combinations in *Arundinaria* are required for two species of *Bashania*, while *B. fargesii* and the remaining two species of *Sarocalamus* already have combinations in that genus, and the affinities of three further, more recently described species of *Bashania* remain unclear.

Bonia

Bonia parvifloscula (W. T. Lin) N. H. Xia, comb. nov. Basionym: *Monocladus parvifloscula* W. T. Lin, J. Bamboo Res. 12(3): 3. 1993. TYPE: China. Guangdong: Zhaoqing, Qixingyan, *Z. K. Li 84126* (holotype, CANT).

The genus *Monocladus* Chia, H. L. Fung & Y. L. Yang et al. was established for tropical bamboos from south China with solitary branches and spikelets with a well-separated basal floret. It was not realized that species of the earlier genus *Bonia* Balansa also had these characteristics (Xia, 1996). The characteristics of *Monocladus parvifloscula* are not well known as the only collections made so far are poor, but it would appear that it also represents a species of *Bonia* rather than any other genus.

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